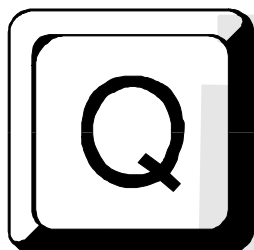

TPRS

*The official journal of the
leading regional amateur
radio digital communications
organization of the Americas*



Quarterly Report

FEBRUARY 1998

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President's Report

Tom McDermott, N5EG

There's been a lot going on the last few months. Sadly, one of TPRS's long-time supportive and energetic members, Jim Brooks, W5ERO, passed away at the end of November. Jim was responsible for personally building and putting on the air many of the TexNet nodes in west Texas. Jim was a dear friend to many in the club, and always was the first to offer help when it was needed. We will all miss Jim very much.

TPRS held it's 1997 Fall Digital Symposium on Saturday, December 6th in Austin. There were a number of sessions, and the presentations were very good. They were taped by Greg Jones, and are available from the TPRS web site, <http://www.tprs.org>. You can listen to the audio, and pick up an electronic copy of the presentation handouts in Powerpoint file format from the web site. I highly recommend taking a look. A last minute change of the meeting room had us scurrying around to setup a replacement. But we got a fine room indeed, with theater-style seating, a podium, and overhead projector. Several in the group and the audience discussed Internet Protocol (IP) and how it could be used in high-speed radio setups. There are obviously many Internet experts around just waiting for equipment to be ready to play with.

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TPRS



Quarterly Report

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The Texas VHF-FM society held it's winter meeting on January 31, at UT Arlington. TPRS was there as a sponsor. It was a good chance to meet old friends. Kent Britain, WA5VJB made an interesting presentation on different antennas that can be built for VHF and UHF, he showed some homebrew log-periodics, and a radome-style patch antenna. Ken always gives good presentations. If you have a need to find your VHF-FM frequency coordinator or other official, their name, address, region, mail and email addresses are listed on the TPRS web site - it's very convenient.

Hamcom 1998 Announced

Hamcom will be held again this year at the Arlington Convention Center. It is scheduled for Friday, Saturday, and Sunday, June 5,6, and 7, 1998. This year, Hamcom will also be the ARRL West Gulf Division Convention. Last year's event showed about 20% growth in attendance over 1996. The recent Miami hamfest had a good increase in attendance over last year, and if Hamcom follows the trend, it will mean a significant increase two years running. This year the Convention Center entrance has been moved to the south side of the convention center. Additionally, 3 entrances to the parking areas will be available. TPRS is planning to have sessions on packet, computers, Internet, and other interesting topics on Saturday, as well as our booth. Rumor has it that some of the spread spectrum hardware under development may be displayed at the booth, and during the presentations. It probably won't be functional, but it will be physical. Saturday night we usually have a nice evening at a local restaurant. The tentative schedule for Hamcom has been established, but this will change as various people make (or don't make) commitments. This year, TPRS has two openings for directors on the board (their terms expire in June of 1998). The expiring terms are of David Wolf, WO5H, and Joe Borovetz, WA5LHS. If you have an interest in serving on the board, or know someone who does, please send me email: n5eg@tapr.org. TPRS is a member of the steering board for Hamcom, and

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I usually attend the steering meetings once a month. If you have suggestions as to how TPRS should participate, please let me know. Hamcom is about ready for the newsletter print wrap up - about Mid March, with a mailing in April.

FRIDAY - JUNE 5, 1998

12:00 Noon · Inside & Outside Flea Market and Exhibits Set-up Begins

12:00 Noon · Registration Desk Opens

5:00 PM · Inside Flea Market opens to attendees

9:00 PM · Inside Flea Market Closes

Testing - M10 - 12

2:00 PM · Friday Test Sessions Start

7:00 PM · Evening Test Session

SATURDAY - JUNE 6, 1998

Flea Markets

5:00 AM · Outside Flea Market Opens for set up

7:00 AM · Inside Flea Market Opens

5:00 PM · Flea Markets Close

Exhibit Hall · Open 9:00 AM-5:00 PM

Transmitter Hunt · Pre Hunt Meeting 2:45 PM

General Programs - M1

Digital Programs - M2-4

Forums - M5-7

General - M6

AmSat Programs - M8

Ladies Programs - M9

Testing - M10 - 12

SUNDAY - JUNE 7, 1998

General Programs - M1

Forums - M5-7

General - M6

Forums - M8

Skywarn - M5-8

FCC Opens Up 28 Ghz. LMDS Spectrum Auctions

The FCC opened up the long-awaited spectrum auction for LMDS (Local Multipoint Distribution Service). It had been delayed since the previous year. LMDS is a service in the 28 Ghz. band. The auctioned spectrum contains 850 Mhz (!) spectrum from the hub to the user (downstream), and 150

Mhz from a user to the hub (upstream). Bidders had to declare their intent to bid by making an up-front payment to the FCC depending on how many POPs were in the area they were bidding for. Almost 150 bidders qualified for the auction, and the first round of bids will start shortly.

At 28 Ghz., the range of transmission is about 1-3 miles, depending on the part of the country you are in, and the reliability needed. There is severe rainfall attenuation at 28 Ghz. In areas with heavy rainfall, and high reliability requirements (.99995 availability) the range can be under one mile. The service is envisaged to be initially used to supply wideband data and video services to small businesses. At one time, LMDS was going to provide wireless cable TV, but those plans seem to have fallen through, apparently due to lack of good business cases to back them up. Initially, 10 Mb/s Ethernet LAN connections appear to be a good business. Certainly the data rate will move higher in the future. Given the interest in the qualifying round (about \$350 million), it seems like the FCC may raise more money than they did in the 2 Ghz. WCS auction (about \$13 million). Some MTA's in the WCS auction went for one dollar!

TAPR Spread Spectrum Radio

Bob Stricklin, N5BRG and I have continued to work on the TAPR spread spectrum radio (described in the August '97 and November '97 issues of the TPRS Quarterly Report). The processor, DRAM, and FLASH memory portion of the circuits are operational. The processor used on the radio is a Motorola 38360. It's really a very sophisticated unit, and that means there was a lot of time struggling to get all the 280 pins wired right, and all the configuration registers set to meaningful values. The '360 is a neat chip - it includes a Background Debug Mode (BDM) interface right on-chip. This means you can connect an external PC-based debugger right to a 10-pin connector wired to the '360, and have full debug capability available without any additional hardware on the board. This gives single-step, fill memory, trace, download software, etc. capability. We have 4 megabytes of DRAM and 2 megabytes of FLASH

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memory up and running on the prototype. The '360 is a full 32-bit processor, and it runs at 25 Mhz, and includes 4 serial channels, one of which is a full Ethernet interface (minus the analog electronics, which takes one more chip). This sort of blows the doors off our 1985-vintage Z80 on the TexNet design!

On the analog side of the radio, the frequency-hopping oscillators are up and running great. They hop band-edge to band-edge (high side injection) in about 6 milliseconds. So this, at least, should not limit the hopping rate to less than 10 milliseconds. The oscillators also have a nice clean spectrum. Photos of the hopping VCOs and spectrum analyzer plots are on the TAPR web site (<http://www.tapr.org>).

On the software side of the radio, we have acquired a copy of XINU (a pre-emptive multitasking, prioritized scheduler) and a full-blown TCP/IP stack based on the design in the books by Doug Comer. We have to change the assembly modules, and port the code over from a SUN 3 workstation to the 68360 design. The total RTOS/STACK design is 630 different software code modules! Then we actually have to write the radio code after that. I think the software design staff will be busy this summer (and then some).

I will look forward to seeing everyone at Hamcom this year. Make plans to attend, you will be glad you did.

Losing Wireline Connection

It is with great regret and sadness that the following report is filed: Informal notification has been received from WorldCom that the donated wireline facilities linking San Antonio/SDallas/Abilene/Midland/Lubbock Austin and Amarillo WILL BE lost in the very near future-probably within two to three weeks. This will affect BOTH the TEXNET packet network and the SouthWestLynx voice network. This loss is NOT due to WorldCom declining to continue the service but that we were told that

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Texas Packet Radio Society, Inc.

TPRS was founded in 1985 and is an educational, public service, and scientific research non-profit corporation. Texas Packet Radio Society goals are:

- 1- design and research amateur radio packet networks
- 2- provide education in the area of general packet usage

To accomplish better communications in the region, TPRS has been organizing statewide working groups to cover various networking topics. The current working groups are the Mailbox/BBS Group, TCP/IP Group, and the TexNet Support Group. TPRS hopes that these working groups will help promote information exchange in their respected areas in Texas. New working groups are formed as needed to provide channels for discussion and to help provide direction for that area of digital communications. Anyone can participate in a working group; TPRS membership is not required.

TexNet

TPRS has established a digital packet network protocol, a standard hardware package for the network nodes, and software modules that implement the TexNet network.

The basic design philosophy of TexNet is an open, inexpensive, multi-resource, high speed 'backbone' with access through multi-connect capable local nodes. On the high speed side, TexNet is a 9600 baud network system. For local access, compatibility with the typical 2 meter AX.25, 1200 baud, AFSK/FM station is the operational norm. Other baud rates and modulation techniques can be supported on the primary user port or secondary port. The system is totally compatible with both versions of the AX.25 protocol specifications for user connections. With these general specifications, TexNet has been designed and tested to enable all users to take advantage of this high speed, full protocol protected packet network system.

Each node offers, in addition to TexNet access, local area digipeater service, 2 conference bridges for full protocol protected roundtable or net operation, a full multi-connect, multi-user mailbox system, a local console for installation and maintenance setups, a debugger module for long distance and local software monitoring, and an interface for a weather information server for regional weather information, if available.

The NCP-PC (TexNet for PC) creates a direct interface to the PC platform. The Z80 based PC card supports 4 channels for communications. This co-processor approach allows the AX.25 and TexNet-IP to run on the card without affecting the PC. This allows the full power of the PC to be used for network applications. The versatility of this board is only now being developed and applications are endless.

The TexNet Network

The Texas TexNet network system has been operational since October 1986. When fully operational, the network reaches from the border of Mexico to Missouri. Use of the Texas TexNet system is open to all amateur operators. TPRS has been coordinating the installation of the Texas TexNet system. Further expansion of the system depends entirely upon the amateur community.

INFORMATION

TPRS is interested in spreading our information and research efforts as widely as possible. We want other groups involved with packet efforts to get in contact with us. We will provide information for those amateur packet groups that are interested in this system for their areas. If you would like more information concerning TPRS or TexNet, please drop a letter to:

Texas Packet Radio Society, Inc.
P. O. Box 50238
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TPRS MEMBERSHIP

TPRS membership is widespread with most members located in Texas, but members are located in other states and in foreign countries. Membership is open to any interested person. If you are interested in becoming a member and receiving the TPRS Quarterly, please send your name, address and call with membership dues of \$12 per year. A membership application is available elsewhere in this issue.

WorldCom is closing ALL of their POPs and getting out of the END USER special circuit business. WorldCom will no longer have, maintain nor support Multiplex systems, channel banks nor bridges. They are turning all end user subscriber business over to the local telephone companies (i.e. SWBell) and devoting their business to large volume fiber systems. Their interconnects will all be at the T-1 or greater level. WorldCom has exhausted every means trying to find a way to continue providing us with the service. The "wherewithall" simply will no longer exist. They continue to be willing to provide the long-haul circuits but will have no way to extend them to us. Channel banks and associated cable pairs will be the property of the phone company (i.e. SWBell/GTE etc). These entities do not have a history of providing donated facilities to the amateur community. There are ongoing low-level contacts continuing in the hope that some arrangement might be made with these companies but the outlook is dim at this point. At present the BEST hope may be paying for TWO circuits (one packet/one voice) between San Antonio and Midland but it is too early to tell if this is either possible or financially feasible. It is very important that it be clearly understood by all just how hard the management/engineering personnel of WorldCom have worked to find a solution. We shall be ever grateful to them for these efforts and for the tremendous service they have provided over the years. It should also be noted these losses will NOT affect the "mainline" TEXNET backbone from Sherman through Dallas, Austin, San Antonio to the Rio Grande Valley. It remains intact however the alternate routing capabilities we have enjoyed will be gone. Just how BBS and DXCluster routing will be solved remain somewhat nebulous at present. It is hoped that some sort of meeting might be arranged during the Midland Swapfest in two weeks to discuss these subjects. Reestablishing links between some/all of these locations via RF is NOT impossible. Its a matter of whether the desire is there. The biggest hurdle would be sites/antennas/feedlines. Virtually everything else is "laying around". We all have the opportunity to look at this as either a challenge or a kick in the mouth. I prefer to see the opportunities.

73

Harry NOCCW

Texnet Network Manager

Telemetry in TexNet

by Bob Morgan, WB5AOH

Conclusion

What are the commands? Which nodes can issue them? Which ones are local, and which ones are remote? A remote-only command is one that (for memory space reasons) only operates on some other node than the one you are connected to at the time. A local-only command only operates at the node that you are connected to at the time. The commands that are both local and remote exist as two versions of the same command. Starting with v1.72, which dates back to around 1995, there is a remote-user inquiry of the form:

R U @NODENAME

which returns a list of connected stations, and five layer 2 (or AX.25) data about them. There is no local equivalent. The represented data has changed slightly from version to version, but now includes AX.25 state, queue depth, L3 function/port, T3 timer, and retries. Starting with V1.74 in mid 1996, I created a remote voltage command, and also a voltage display function that is both local and remote.

The R V @NODENAME

is a remote-only command that delivers a display identical to the R U command, but delivers these values: port number, limiter, frequency, deviation, and a spare or unused number, for each connected station. It is primarily used to troubleshoot trunk performance paths, but displays both trunks and users, by callsign/ssid. The deviation must be interpreted using the previous number from the frequency as well, with the conditioning circuitry now in use.

The V @NODENAME command exists in either a remote or local version, and does a dump of the scanned readings, some spare readings in memory, and also a loopback set of readings for each transmitter port. The local version ALSO tells the user how his own signal is being received at the node. If it is a local user, there will be 3 receiver readings, for limiter, frequency, and deviation, and also 4 transmitter loopback readings that tell how

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the node receiver is seeing the node transmitter limiter (saturated of course), frequency, deviation, and transmitter drive. There will be a block of 4 numbers per line. The first 16 numbers are the actual A/D system (for a board using the ADC0809 only the first 8 will be used). The next 16 are internal memory, and represent different things on different versions, and for V1.74 are irrelevant. Then there will be a set of loopback transmitter readings, one set per port, again in the order of limiter saturated), frequency, deviation, and transmitter drive.

If you are using the R V @node command, it tells which port is of interest, since you have to look up each port's curve data independently, since the radios will almost always not be identical.

If you are using the local version of the V @node command, it is assumed that you know which port (0, 1 or 2) that you have connected to. For Moody users, that will be port 0, but for most other nodes on the network that use the 3 channel NCP, it will most likely be port 1, the primary user port, or possibly port 2, the alternate port where an alternate exists physically. If a port is unused, the numbers for the port will be displayed, but meaningless in most cases, but sometimes used for other environment readings on some nodes. All of the displayed numbers are decimal, or base 10, integers, and will always be between 000 and 255. You don't have to convert from hex. You do have to scale the values, or look them up on a table or graph. We simply don't have enough EPROM for a database and the conversion routines. A user could automate this task if he wanted to program it up. All of the inquiry commands are unrestricted, and can be used by anyone, but some nodes of v1.72, 1.73, or earlier don't have the commands to do so.

As for the status of revisions across the network, 1.72 is considered standard issue, and 1.73 is identical except for a tweak used at PMS nodes. V1.74 is installed at a few nodes, and it wasn't a big enough of an advantage to wholesale change out at all nodes. V1.75 is being betatested, and when it is ready, contains some new fixes and features, and we will want to retrofit it into all nodes except

those supporting a PMS disk (it won't run disk drives). It will be of particular interest to nodes supporting DXC's, since it should fix some errors we have with DXC connections, but remember it is still under test and revision, it isn't out yet. DXC nodes, and west Texas wireline nodes will need priority attention to change to this software as early as possible. (We hope that it is all out by publication time though).

(There is also a hardware retrofit to the wireline modems on the west Texas wireline, and it will greatly improve circuit performance, as we get more nodes retrofitted. Some of them have been shipped out).

The S @NODENAME statistics function, among other things, will display the revision level of the node's software, if you don't know it. Also, the A/D hardware retrofit is supported for TNC2's starting with V1.74, Moody for instance, was first. The NCP version of the A/D hardware isn't supported until V1.75. The hardware requirements for the various nodes A/D adapters are identical, except for any applicable mechanical placement concerns, like which way the board has to overhang the Z80 socket to fit the chassis. Electrically they are identical, with identical addressing. At present times, we are only supporting a schematic for a breadboard, we don't have any PC boards designed, much less arranged for. The 8 channel ADC0809 would be more practical for a one-port TNC2, unless some external inputs were desired also, weather station for instance, and the 8 channel chip lists for much less money, compared to the 16 channel. The A/D converter is optional of course, and if it is not installed, or if it fails or is removed, the software will recognize that the converter is not in service and ignore any reference to it, and will stick zeroes in all values it would convert if it were available. It is declared out of service if a completion interrupt is not received in a reasonable time. There are no particular software requirements for installing a converter, other than an upgrade to v1.74 or v1.75 if this hasn't been done yet.

I will post a current listing of the various nodes A/D

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system databases and curvefits on the various PMS's as a permanent file, for those who are interested in tinkering with the telemetry, or possibly reading their own stations signal parameters. Right now that just applies to a couple of users at Moody, but over the next year I hope to have A/D hardware on other nodes. In some cases, the user port radio might not be connected to the A/D system, depending on whether or not it might happen to have external test points to connect to. These are often synthesized amateur transceivers, and some don't have anything convenient to connect external measurements to. Most of the intent of this telemetry project was to support remote trunk troubleshooting, and help improve trunk performance and reliability. The project has been in the planning stages for several years, probably dating back to 1990 or before, and has finally been realized. Drop me a line if you are interested in a schematic. If you have CirCad or something compatible, I can send it to you electronically. 73 and enjoy it,

Bob

TPRS

TexNet Status - December 1997

Harry Ridenour

TPRS

Nodes In-Service 12-97 (1/2)

• Texas Nodes:

NDALLAS (w/pms)	ROCPRT	FTWORTH
AUSTIN	REFUGIO	DENTON
GERONMO (w/pms)	VCTRIA	SHERMAN
ALAMO	AOHTST(R&D node)	FANNIN
SANTEX	AOHPMS	SDALLAS
FLORES	AUSDXC	ABILENE
SALAMO	AOHLNK	LUBBOCK
CORPUS	NWS (w/pms)	LBBDXC
ALICE	AUSTEST (R&D node)	AMARILO
FALFUR	MOODY	MIDLAND
ISIDRO	WACO	MAFDXC
VALLEY	MURPHY	BOERNE
BROWX (w/pms)	RICH (R&D node)	
TAMUK	CARDNAL	
	GREENVL	

TPRS

Nodes In-Service 12-97 (2/2)

• Oklahoma/Arkansas/Missouri Nodes:

CLAYTON	FAYETVL
FTSMITH	HOGEEYE
MAGAZIN	GARFLD
RUSLVL	OARSMO
LROCK	
LRTST (R&D node)	
FTGIBSN	
MUSKOGA	
MKOTST (w/pms)	
TULWX	
OKEMAH	
CHOCTAW	

TPRS

Nodes Out-of-Service (1/2)

• PETTUS

- Out of service pending re-install.
- Has been repaired.

• FANNIN

- Out of service pending re-install after relocation.
- Expected very soon.

TPRS

Nodes Out-of-Service (2/2)

• KINGLNK

- Removed from active list 1 Dec97.
- Not expected to return.

• ALPINE

- Removed from active list 1 Dec 97.
- Not expected to return.

TPRS

Planned New Nodes

- Three nodes assembled and tested. Ready for install pending site access, antenna installation, mechanical work or final tweaking:

• KERRVL

- to be RF-linked to Boerne

• SATLNK/BROLNK

- To be connected by donated fiber optic path between San Antonio and Raymondville.
- Southern end will be RF-linked to Valley node, northern end RF-linked to Santex.

• New Braunfels

- Tentative plan at New Braunfels Weather Service office to provide weather products and NEXRAD images.

TPRS

DX Cluster Status

- The Midland, San Antonio, Austin and Lubbock DX clusters continue to use TEXNET on a full time basis.
- The Valley cluster uses TEXNET as a backup path.
- The DALLAS area has chosen not to utilize TEXNET and uses Internet or a two meter link to West Texas.
 - The 2 meter user port radio @ SDALLAS scheduled to be removed and returned to the cluster group that owns it.

TPRS

BBS Forwarding

- BBS Forwarding is heavily dependent on TEXNET. Estimate that 95% of BBS forwarding activity in TEXAS is via TEXNET.

Nominations for TPRS Director positions now Open.

Two of the five TPRS director's spots will be expiring this June. As of this time, we are soliciting nominations for both of these two year terms. Any member of TPRS can apply or be nominated for a position on the board of directors. Also, nominations will be accepted at the TPRS Annual Business meeting, on Saturday, June 6, 1998, at Hamcom in Arlington, Tx. You can mail nominations to the TPRS mailing address, or email them to the president, at n5eg@tapr.org

All director nominations are voted by the membership at the general meeting.

Tentative TPRS Digital Program for Hamcom 1998

We have received confirmations from all but one speaker for the TPRS digital forum at Hamcom this year. The following program list is tentative, pending final time assignments and confirmations. We'll publish any updates in the next Quarterly Report, and in the Hamcom final program.

Tentative TPRS Digital Symposium Hamcom, Arlington, Tx.

Saturday, June 6, 1998

-
- 9:00 - 9:30 Introduction to Digital Modes
- Jim Neely, WA5LHS
- 9:30 - 10:30 Intro to Internet
- Lee Ziegenhals, N5LYT
- 10:30 - 11:00 Intro to High-Speed Packet
- Greg Jones, WD5IVD
- 11:00 - 12:00 Spread Spectrum
- Greg Jones, WD5IVD,
- Tom McDermott, N5EG
- 12:00 - 12:30 TPRS annual meeting
- 12:30 - 1:00 break
- 1:00 - 2:00 APRS
- Mike Heskett, WB5QLD
- 2:00 - 2:30 Linux Systems
- Bill Reed, WD0ETZ
- 2:30 - 3:10 TexNet & the Internet / Weather
- Bob Morgan, WB5AOH
- 3:10 - 3:30 TEXNET update
- Harry Ridenour, N0CCW
- 3:30 - 4:00 BBS update
- Hoss Karimi, WA5ZAI

TPRS dinner - about 6:00 PM., usually at On the Border restaurant just east of the convention center, and just south of I-30.

TPRS Node Assignments
Official Publication: June, 1995
Subject to Corrections/Additions/Deletions.

X = ACTIVE/COMPLETED

T = ACTIVE/TEST

P = PENDING

Nr	Status	City/Town	Alias	Call	Port	Remarks
1	X	Dallas	TEXNET	WR5C	145.05	PMS
2	T	Richardson	TESTBED	W9DDD	None	R&D
3	T	Richardson	RICH	W9DDD	None	R&D
4	X	Murphy	MURPHY	N5EG	145.09	
5	X	Ft. Worth	NWS	N5HCO	None	Weather PMS
6						
7	P	Beorne	BEORNE	N5VUO	145.01	(Bridged w/BNE THENET)
8	X	Geronimo	GERONMO	WB5NSN	145.07	PMS (AKA GERLNK)
9	X	Austin	AUSTIN	WA5LHS	145.07	
10	T	Austin	NQ9Q	Bryan Stroud Test Node		
11	X	San Antonio	ALAMO	N0CCW	145.09/223.44	
12	X	San Antonio	SALAMO	WA2MCT	Interface to SNS/NO USER PORT	
13	X	Denton	DENTON	W5NGU	145.03	
14	X	Lubbock	LUBBOCK	W5ERO	145.05	
15	X	Midland	MIDLAND	WB5RXA	145.05	
16	X	Greenville	GREENVL	WB5IZL	145.07	
17	X	Midland	MAFDXC	WF5E	223.58	DXCluster port 2
18	T	Austin	NQ9Q	Bryan Stroud Test Node		
19	X	Rockport	ROCPRT	N5JKH	144.99/PORT 2	446.1
20	X	C. Christi	CORPUS	N5XCH	145.05	INTERFACE TO SNS
21	X	Pettus	PETTUS	KA5BWL	147.56	
22	T	Corpus	ESTES	KB5GD	None	Test Node
23	X	Lubbock	LBBDXC	KA5EJX	DXCLUSTER	
24	X	Austin	AUSDXC	WB5VZL	144.99	
25	P	Corpus Ch	CCSU	N5AHD	TEXT Node	
26	X	Victoria	VCTRIA	W5DSC	145.01	
27	X	Alice	ALICE	K5DYY	145.07	
28	X	Amarillo	AMARILO	WD5ILA	145.05	
29	X	Abilene	ABILENE	WB5EKW	145.05	
30						
31	P	Houston	HOUSTON	WD5HJP	UNKN	Due ???
32	P	Pearland	PEARL	UNKN	UNKN	Due ???
33	P	Rosenburg	ROSBRG	UNKN	UNKN	Due ???
34	X	San Antonio	SANTEX	WB5FNZ	223.58	
40	P	Hempstead	HMPSTD			Due ???
41						
42	X	Kingsville	TAMUK	W5ZD	144.91	(aka KINGVL)
43	P	Bryan/CollStn	SBRAZOS	KF5LN	145.05/446.10	Port 0 (PENDING RE-INSTALLATION)
44	P	Bryan/CollStn	NBRAZOS	KG5ZD	446.1	(See Nr 43)
45	X	Fannin County	FANNIN	WB5RDD	145.05	
46	X	Sherman	SHERMAN	WB5CVR	144.93	
47	X	South Dallas	SDALLAS	KF5RN	None	
48	X	Waco	WACO	WD5KAL	145.09	
49	X	Falfurrias	FALFUR	WB5FRO	None	

50	X	Mercedes	VALLEY	NA5C	144.60	DXCluster port 2
51	X	San Isidro	ISIDRO	K5RAV	None	
52	P	Brownsville	BROWX	K5RAV-?	NWS node	25.54.57N 97.25.08W
73	X	Fort Worth	FTWORTH	N5AUX	144.99	
80	T	AOHTST	AUSTIN	WB5AOH	NONE	R&D AUSTIN
98	X	Murphy	CARDNAL	WA6ROC	None	R&D/PMS/NMS/NETCON

(100-150) Reserved for TexLink Node Usage

105	X	Floresville	FLORES	WD5DOE	None	
106						
107	X	King Mountain	KINGLNK	WB5YHC	145.05	
108	X	Alpine	ALPINE	WA5ROE	145.05	
109	X	Refugio	REFUGIO	WB5OLT	None	
110	X	San Angelo	ANGELO	WA5JSN	145.05	
111						
112	P	PLAINVIEW	PLVLNK	KC5ALN	145.05	
113						
114		Reserved - WB5DDP				
115		Reserved - WB5DDP				
116						
118		Moody	MOODY	W5ZDN	None	
119						
120						
121						
122						

(151-249) Reserved for Non-Texas Node Usage

160	X	Ft Gibson OK	FTGIBSN	WB5AOH	145.01	
161	X	Muskogee OK	MKOTST	WA5VMS	145.05	PMS
162	X	Muskogee OK	MUSKOGEE	W5EJK	145.09/223.60	
163						
164	X	Lincoln AR	FAYETVL	WD5DUC	145.09	port 446.5
165	X	Clayton OK	CLAYTON	W5CUQ	145.03	
166	X	Ft Smith AR	FTSMITH	W5ANR	144.91	
167						
169	X	Tulsa OK	TULWX	N5WX	NWS WX	Server
172	X	Okemah OK	OKEMAH	WB5HLR	145.69	
173	X	Choctaw OK	CHOCTAW	AB5H	145.69	
174	X	Prarie Grove AR	HOGYE	K5FXB	None	
175	X	Garfield AR	GARFLD	WB2ROC	None	
176	X	Aurora Missouri	OARSMO	KF0RH	145.05	
177	X	Mt Magazine AR	MAGAZIN	KF5XB	145.61	
178	X	Russelville	RSLVL	WB5BHS	UNKN	
179	X	Little Rock AR	LROCK	WB5SQK	144.97	PORT 2 446.50(FUTURE)
209	T	Little Rock AR	LRTST	KA5SQK	TEST Node	

(250-255) Network Reserve

If you are a TexNet node opearator/owner and have a correction to make to the list, advise to NOCCW@K3WGF.#STX.TX.USA.NOAM, or leave a message for NOCCW on the NDALLAS PMS of TexNet.



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**Maps inside, or visit the
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Be sure to visit the TPRS web page:
<http://www.tprs.org>
for the latest information on TPRS
activities.

A current listing of Packet nodes,
frequencies, and networks is located in the
**North American Digital Systems
Directory (NADSD) on-line at:**
<http://www.tapr.org/directory/index.html>

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